

What is claimed is:

1. A method of producing a beam of light for a display system comprising:

5 generating a light beam having a transverse cross section that is elongate along a longitudinal axis; and

moving a plurality of beam-modifying optical elements sequentially along a travel path that intersects the light path with the longitudinal axis of the transverse cross section of the light beam oriented transverse to the travel path.

10 2. The method of claim 1, where moving a plurality of optical elements includes moving differently colored filters.

3. The method of claim 1, where moving a plurality of optical elements includes separating sequentially adjacent optical elements along transition regions extending transverse to the travel path.

4. The method of claim 3, where moving a plurality of beam-modifying optical elements includes moving a plurality of beam-modifying optical elements sequentially along a travel path that intersects the light path with the longitudinal axis of the transverse cross section of the light beam generally aligned with the transition regions.

5. The method of claim 1, where generating a light beam includes generating a light beam having a generally circular transverse cross section and modifying the light beam having a generally circular transverse cross section to have a transverse cross section that is elongate along the longitudinal axis.

6. The method of claim 5, where modifying the light beam includes at least one of reflecting the light beam off of an anamorphic surface and transmitting the light beam through anamorphic lenses.

7. The method of claim 5, further comprising reflecting the light beam having an elongate transverse cross section back along a portion of the light path.

5 8. The method of claim 7, further comprising polarizing the light beam, and diverting the reflected polarized light beam from the portion of the light path.

9. The method of claim 8, further comprising, modifying the reflected  
10 polarized light beam having an elongate transverse cross section in a manner decreasing the elongation of the transverse cross section of the light beam.

10. The method of claim 1, further comprising modifying the light beam in the light path, downstream from the intersection of the light path and  
15 the travel path, in a manner decreasing the elongation of the transverse cross section of the light beam.

11. The method of claim 10, where modifying the light beam includes at least one of reflecting the light beam off of an anamorphic surface and  
20 transmitting the light through an anamorphic lens.

12. The method of claim 10, further comprising reflecting the light beam having an elongate transverse cross section back along a portion of the light path.

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13. The method of claim 12, further comprising polarizing the light beam, and diverting the reflected polarized light beam from the portion of the light path.

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14. A light path comprising:

a light source device configured to produce a light beam having a transverse cross section that is elongate along a longitudinal axis; and

5 a plurality of beam-modifying optical elements configured to move sequentially along a travel path that intersects the light beam with the longitudinal axis of the transverse cross section of the light beam, transverse to the travel path.

15. The light path of claim 14, where the optical elements include  
10 differently colored filters.

16. The light path of claim 14, where the optical elements include sequentially adjacent optical elements that are separated by a transition region extending transverse to the travel path, and the longitudinal axis of the  
15 transverse cross section of the light beam is generally aligned with the transition region as the transition region passes through the light beam.

17. The light path of claim 14, where the light source device includes a light source configured to produce a light beam having a generally circular  
20 transverse cross section, and a first anamorphic optical device configured to modify the light beam having a generally circular transverse cross section to have a transverse cross section that is elongate along the longitudinal axis.

18. The light path of claim 17, where the anamorphic optical device  
25 includes at least one of a reflector and a lens.

19. The light path of claim 17, where the light beam travels along a light path, and further comprising a reflector configured to reflect the light beam having an elongate transverse cross section back along a portion of the light  
30 path.

20. The light path of claim 19, further comprising a polarizer configured to polarize the light beam, and a diverter configured to divert the reflected polarized light beam from the portion of the light path.

5        21. The light path of claim 20, where the anamorphic optical device is positioned in the portion of the light path, whereby the reflected light is modified to have a transverse cross section that has increased circumferential uniformity.

10        22. The light path of claim 14, further comprising an anamorphic optical device configured to modify the light beam downstream from the intersection of the light path and the travel path, to have a transverse cross section that has decreased elongation.

15        23. The light path of claim 22, where the anamorphic optical device includes at least one of a reflector and a lens.

24. A generator of a varying light beam for a display system comprising:

20        a light source device configured to produce a light beam directed along a light path, the light beam having a transverse cross section that is elongate along a longitudinal axis; and

25        a plurality of beam-modifying optical elements configured to move sequentially along a travel path that intersects the light path with the longitudinal axis of the transverse cross section of the light beam, transverse to the travel path.

25. The generator of claim 24, where the optical elements are colored filters.

26. The generator of claim 24, where the light source device includes a light source configured to produce a light beam having a generally circular transverse cross section, and a first anamorphic optical device configured to modify the light beam having a generally circular transverse cross section to have a transverse cross section that is elongate along the longitudinal axis.

27. The generator of claim 26, where the anamorphic optical device includes at least one of a reflector and a lens.

28. The generator of claim 26, further comprising a reflector configured to reflect the light beam having an elongate transverse cross section back along a portion of the light path.

29. The generator of claim 28, further comprising a polarizer configured to polarize the light beam, and a diverter configured to divert the reflected polarized light beam from the portion of the light path.

30. The generator of claim 29, where the anamorphic optical device is positioned in the portion of the light path, whereby the reflected light is modified to have a transverse cross section that has increased circumferential uniformity.

31. The generator of claim 24, further comprising an anamorphic optical device configured to modify the light beam in the light path downstream from the intersection of the light path and the travel path, to have a transverse cross section that has decreased elongation.

32. The generator of claim 31, where the anamorphic optical device includes at least one of a reflector and a lens.

33. A display system comprising:

a light source device configured to produce a light beam directed along a light path having a transverse cross section that is elongate along a longitudinal axis;

5 a plurality of beam-modifying optical elements configured to move sequentially along a travel path that intersects the light path with the longitudinal axis of the transverse cross section of the light beam transverse to the travel path;

a spatial light modulator for modulating the light of sequentially different colors according to received image information; and

10 projection optics for directing the modulated light beam along the light path.

34. The display system of claim 24, where the optical elements are colored filters.

35. The display system of claim 33, where the light source device includes a light source configured to produce a light beam having a generally circular transverse cross section, and a first anamorphic optical device

20 configured to modify the light beam having a generally circular transverse cross section to have a transverse cross section that is elongate along the longitudinal axis.

36. The display system of claim 35, where the anamorphic optical device includes at least one of a reflector and a lens.

37. The display system of claim 35, further comprising a reflector configured to reflect the light beam having an elongate transverse cross section back along a portion of the light path.

38. The display system of claim 37, further comprising a polarizer configured to polarize the light beam, and a diverter configured to divert the reflected polarized light beam from the portion of the light path.

5           39. The display system of claim 38, where the anamorphic optical device is positioned in the portion of the light path, whereby the reflected light is modified to have a transverse cross section that has decreased elongation.

10           40. The display system of claim 33, further comprising an anamorphic optical device configured to modify the light beam in the light path downstream from the intersection of the light path and the travel path, to have a transverse cross section that has decreased elongation.

15           41. The display system of claim 40, where the anamorphic optical device includes at least one of a reflector and a lens.

42. A display system comprising:

a light source configured to produce a light beam having a generally circular transverse cross section;

5 a first anamorphic optical device configured to modify the light beam having a generally circular transverse cross section to have a transverse cross section that is elongate along a longitudinal axis;

10 a filter assembly having a plurality of differently colored filters, a support for supporting the plurality of differently colored filters adjacent to each other, the filter assembly being configured to move the plurality of differently colored filters sequentially along a travel path that intersects the light path with the longitudinal axis of the transverse cross section of the light beam transverse to the travel path, sequentially adjacent filters having adjacent edges that are generally aligned with the longitudinal axis of the transverse cross section of the light beam, when the adjacent edges are impinged by the light beam, the filter  
15 assembly producing a light beam of sequentially different colors;

a light integrating rod having an aperture of a first configuration;

20 a second anamorphic optical device configured to modify the light beam in the light path between the filter assembly and the light integrating rod, to have a transverse cross section that more closely corresponds to the first configuration than does the light beam with a transverse cross section that is elongate along a longitudinal axis;

a spatial light modulator for modulating the light of sequentially different colors according to received image information; and

25 projection optics for directing the modulated light beam along the light path.



43. The display system of claim 42, where the filter assembly includes a color wheel having the filters arranged circumferentially.

44. The display system of claim 43, where the filters travel in a plane  
5 of rotation with the filter edges extending radially, and the longitudinal axis of the transverse cross section of the light beam extends along a radius of the color wheel.

45. Means for producing a time-varying light beam for a display  
10 system comprising:

means for generating a light beam having a transverse cross section that is elongate along a longitudinal axis;

a plurality of means for modifying the light beam; and

means for moving the plurality of means for modifying the light beam  
15 sequentially along a travel path that intersects the light path with the longitudinal axis of the transverse cross section of the light beam oriented transverse to the travel path.

46. The means for producing a time-varying light beam of claim 45,  
20 where the means for modifying the light beam includes means for filtering different colors from the light beam.

47. The means for producing a time-varying light beam of claim 45,  
where the means for moving the plurality of means for modifying the light beam  
25 is further for separating sequentially adjacent means for modifying the light beam along transition regions extending transverse to the travel path.

48. The means for producing a time-varying light beam of claim 47,  
where the means for moving the plurality of means for modifying the light beam  
30 is further for moving the transition regions through the light beam with the transition regions generally aligned with the longitudinal axis of the light beam.

49. The means for producing a time-varying light beam of claim 45, where the means for generating a light beam is further for generating a light beam having a generally circular transverse cross section and for modifying the light beam having a generally circular transverse cross section to have a transverse cross section that is elongate along the longitudinal axis.

50. A method of producing a beam of light for a display system comprising:

generating a light beam having a given transverse cross section;  
10 modifying the light beam having a given transverse cross section to have a transverse cross section that has a reduced width transverse to a longitudinal axis relative to a length along the longitudinal axis; and  
moving a plurality of beam-modifying optical elements sequentially along a travel path that intersects the modified light beam with the longitudinal axis of  
15 the transverse cross section of the modified light beam oriented transverse to the travel path.

51. A generator of a varying light beam for a display system comprising:

20 a light source configured to produce a light beam having a given transverse cross section;  
a first anamorphic optical device configured to modify the light beam having a generally circular transverse cross section to have a transverse cross section that has a reduced width transverse to a longitudinal axis relative to a  
25 length along the longitudinal axis; and  
a plurality of beam-modifying optical elements configured to move sequentially along a travel path that intersects the modified light beam with the longitudinal axis of the transverse cross section of the modified light beam, transverse to the travel path.